

Making Good Instructors Great: USMC Cognitive Readiness and Instructor Professionalization Initiatives

Sae Schatz, Ph.D.	Kathleen Bartlett, M.A.	Nicole Burley	Capt David Dixon, M.S.	Kenneth Knarr	LtCol Karl Gannon
MESH Solutions, LLC a DSCI Company sschatz@mesh.dsci.com	MESH Solutions, LLC a DSCI Company kbartlett@mesh.dsci.com	MESH Solutions, LLC a DSCI Company nburley@mesh.dsci.com	Policy Management Branch, TECOM david.r.dixon@usmc.mil	Ground Combat Standards Branch, TECOM kenneth.knarr@usmc.mil	Ground Combat Standards Branch, TECOM karl.gannon@usmc.mil

ABSTRACT

After a decade of waging unconventional conflicts, Defense stakeholders now generally accept that the US military has entered a new era of warfare, distinguished from previous generations by its prevalence of insurgent and terrorist tactics, frequency of non-kinetic tactical dilemmas, complexity of the sociocultural context, and emphasis on operational decentralization. To excel under such conditions, each warfighter—down to the lowest echelons—must possess a high degree of cognitive readiness, that is, the mental, emotional, and interpersonal skills that allow him/her to rapidly decide and act in complex, dynamic, and ambiguous environments.

Each of the US Armed Services is addressing cognitive readiness training differently. The Marine Corps, for instance, has embarked on two related, large-scale efforts. First, the USMC Training and Education Command (TECOM) established the Small Unit Decision Making initiative in order to “improve the ability of small unit leaders across the MAGTF to... assess, decide, and act while operating in a more decentralized manner” (Implementation Planning Guidance, p. 9). To achieve this, TECOM personnel and academic advisors are translating advanced instructional methods into actionable forms (e.g., militarized handbooks, instructor development seminars) and launching a pilot course in spring 2012 for noncommissioned officers on decision making. Second, TECOM personnel are examining instructor career progression, looking for strategies to enhance Marine Corps instructors, writ large. In other words, TECOM is looking to take Marine instructors from *good* to *great*.

In this presentation, we will discuss the instructional principles in use by the Small Unit Decision Making and Instructor Professionalization efforts. Specifically, we will describe key instructional strategies for engendering complex cognitive skills and science-based recommendations for making good instructors even better. We will also outline these efforts’ specific approaches and explain how the two plans build upon research-informed recommendations in order to enhance Marine instructors and give them the techniques they need to better prepare their personnel.

ABOUT THE AUTHORS

Sae Schatz, Ph.D. is the Chief Scientist of MESH Solutions, LLC. Her work focuses on education and training for the Defense community, particularly the skills associated with “cognitive readiness.” In addition to her research, Dr. Schatz teaches and mentors University of Central Florida (UCF) Modeling & Simulation graduate students.

Kathleen Bartlett, M.A., is the Director of Research Communication at MESH Solutions, LLC. She has more than twenty-five years of instructional experience, and she has designed and taught a wide array of face-to-face and online courses at UCF, Florida Institute of Technology, and Brevard Community College.

Nicole Burley is an Education and Communication Research Associate at MESH Solutions, LLC. She has consulted as a subject-matter expert on computer-based training and instructional design. Ms. Burley also taught for ten years for Orange County Public Schools, including honors and advanced placement courses.

Capt David Dixon, M.S. is a Marine pilot, and he now leads the Instructor Professionalization initiative at Training and Education Command. Capt Dixon holds a Master’s in Education from Harvard and a M.S. from Stanford.

Kenneth Knarr serves as contract support for Ground Training Division, Training and Education Command. Before working at II Corps Consultants, Inc., he served as a Major in the Marine Corps.

LtCol Karl Gannon oversees the Small Unit Decision Making initiative for the Marine Air-Ground Task Force (MAGTF) T&E Standards Division of the USMC Training and Education Command.

Report Documentation Page		Form Approved OMB No. 0704-0188
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.		
1. REPORT DATE 2012	2. REPORT TYPE	3. DATES COVERED 00-00-2012 to 00-00-2012
4. TITLE AND SUBTITLE Making Good Instructors Great: USMC Cognitive Readiness and Instructor Professionalization Initiatives		5a. CONTRACT NUMBER
		5b. GRANT NUMBER
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER	
	5e. TASK NUMBER	
	5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Training and Education Command,United States Marine Corps,Quantico,VA,23459		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited		
13. SUPPLEMENTARY NOTES Presented at Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC) Dec 3-6, 2012, Orlando, FL, 10 pgs		

14. ABSTRACT

After a decade of waging unconventional conflicts, Defense stakeholders now generally accept that the US military has entered a new era of warfare, distinguished from previous generations by its prevalence of insurgent and terrorist tactics, frequency of non-kinetic tactical dilemmas, complexity of the sociocultural context, and emphasis on operational decentralization. To excel under such conditions, each warfighter?down to the lowest echelons?must possess a high degree of cognitive readiness, that is, the mental, emotional, and interpersonal skills that allow him/her to rapidly decide and act in complex, dynamic, and ambiguous environments. Each of the US Armed Services is addressing cognitive readiness training differently. The Marine Corps, for instance has embarked on two related, large-scale efforts. First, the USMC Training and Education Command (TECOM) established the Small Unit Decision Making initiative in order to ?improve the ability of small unit leaders across the MAGTF to?assess, decide, and act while operating in a more decentralized manner? (Implementation Planning Guidance, p. 9). To achieve this, TECOM personnel and academic advisors are translating advanced instructional methods into actionable forms (e.g., militarized handbooks, instructor development seminars) and launching a pilot course in spring 2012 for noncommissioned officers on decision making. Second, TECOM personnel are examining instructor career progression, looking for strategies to enhance Marine Corps instructors, writ large. In other words, TECOM is looking to take Marine instructors from good to great. In this presentation, we will discuss the instructional principles in use by the Small Unit Decision Making and Instructor Professionalization efforts. Specifically, we will describe key instructional strategies for engendering complex cognitive skills and science-based recommendations for making good instructors even better. We will also outline these efforts? specific approaches and explain how the two plans build upon research-informed recommendations in order to enhance Marine instructors and give them the techniques they need to better prepare their personnel.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:

a. REPORT

unclassified

b. ABSTRACT

unclassified

c. THIS PAGE

unclassified17. LIMITATION OF
ABSTRACT**Same as
Report (SAR)**18. NUMBER
OF PAGES**12**19a. NAME OF
RESPONSIBLE PERSON

Making Good Instructors Great: USMC Cognitive Readiness and Instructor Professionalization Initiatives

Sae Schatz, Ph.D.	Kathleen Bartlett, M.A.	Nicole Burley	Capt David Dixon, M.S.	Kenneth Knarr	LtCol Karl Gannon
MESH Solutions, LLC a DSCI Company sschatz@mesh.dsci.com	MESH Solutions, LLC a DSCI Company kbartlett@mesh.dsci.com	MESH Solutions, LLC a DSCI Company nburley@mesh.dsci.com	Policy Management Branch, TECOM david.r.dixon@usmc.mil	Ground Combat Standards Branch, TECOM kenneth.knarr@usmc.mil	Ground Combat Standards Branch, TECOM karl.gannon@usmc.mil

DEMAND SIGNAL

A classic saying within the military community is that the “most important six inches on the battlefield are between your ears.” This cliché is perhaps truer today than ever before. Since 2001, the United States has openly engaged in an unconventional military conflict defined by a range of counterterrorism, counterinsurgency, peacekeeping, and infrastructure-building initiatives. To excel within this environment, the US Department of Defense (DoD) has adopted new strategic approaches that require military personnel—even at relatively junior levels—to develop greater cognitive skills, so that they are ready to confront whatever challenges they may face.

Cognitive Readiness

The phrase “cognitive readiness” entered the common military language about a decade ago, when it was cited as one of five critical research areas by the Office of the Deputy Under Secretary of Defense for Science and Technology (Etter, 2002). According to John Morrison and J.D. Fletcher (2002), who offered one of its first definitions, cognitive readiness describes the mental preparation an individual must establish and sustain, in order to perform effectively in the complex and unpredictable environment of modern military operations. These conditions require that all military personnel be able to think independently and demonstrate mental, emotional, and interpersonal maturity even under the most stressful conditions. While these attributes have always been valued within the military community, new paradigms, like Full Spectrum Operations and Distributed Operations, make cognitive readiness competencies a necessity (e.g., Becker & Schatz, 2010).

There is no official listing of cognitive readiness skills, but almost everyone agrees that cognitive readiness should be broadly defined to include mental, emotional, and social competencies. Also, cognitive readiness skills include both “taskwork” and “teamwork” components; in other words, cognitive readiness is relevant at the individual and collective (team) levels (Fautua & Schatz, 2012; Fautua, Schatz, & Vierling, 2011).

Operational Demand for Cognitive Readiness

The need for enhanced cognitive readiness is felt particularly by enlisted personnel in the two ground forces, the US Army and US Marine Corps (USMC) because their duties require them to operate at “the edge of chaos” in fast-paced, decentralized, ambiguous contexts (Lynn, 2010; Schatz et al., 2011). As evidence, consider that General Martin Dempsey (former commander for the Army’s Training and Doctrine Command) recently called for “a Campaign of Learning.” In his essays, he urges the Army to invest in a host of organizational and human dynamics initiatives, including methods for developing decision-making expertise and adaptability (Dempsey, 2010a, 2012b, 2011; see also Vane & Toguchi, 2010).

Similarly, in the *Marine Corps Vision & Strategy 2025*, the Commandant emphasizes the importance of small unit leaders and their decision-making abilities. He writes, “Marines at all levels must be prepared to excel in ambiguous and dangerous conditions, operate from a commander’s intent, and with minimal direct supervision” (p. 14). He calls on the training and education community to “prepare Marines for complex conditions and to counter the unexpected” and to help small unit leaders develop their abilities to “make sound decisions...in an increasingly complex environment while potentially operating in a decentralized manner” (p.14).

The remainder of this paper describes steps that the USMC Training and Education Command (TECOM) has taken to address this strategic guidance. These steps include the creation of two complementary initiatives. First, the Small Unit Decision Making (SUDM) effort seeks to define cognitive readiness for Marine non-commissioned officers and then devise approaches for fostering, manning, and otherwise supporting such readiness. Second, the Instructor Professionalization initiative seeks to improve upon the USMC instructor development and evaluation process, so that Marine Corps instructors are better able to develop Marines’ knowledge, skills, and attitudes—particularly those sophisticated and seemingly “intangible” capacities necessary for cognitive readiness.

SMALL UNIT DECISION MAKING

TECOM established the SUDM initiative in 2010 in order to improve “the ability of small unit leaders across the MAGTF to...assess, decide, and act while operating in a more decentralized manner” (*Implementation Planning Guidance*, 2008, p. 9). To achieve this, TECOM personnel and academic advisors have reviewed an extensive body of research and used these lessons learned to devise an implementation approach to enhance personnel’s naturalistic decision-making abilities. TECOM also sponsored a series of workshops at which academic advisors, enlisted personnel, and senior mentors gathered to discuss the initiative and devise actionable strategies for meeting its objectives (SUDM, 2011; see Figure 1).



Figure 1. General Joseph J. Dunford, Assistant Commandant of the Marine Corps, spoke passionately at the 2011 SUDM Workshop, saying “...this discussion about decision making. I think it’s critical and I think it’s probably, you could argue, the critical enabler for small unit leadership, and I think small unit leadership is the critical enabler for success of the MAGTF [Marine Air-Ground Task Force].”

Essentially, the initiative seeks to significantly increase small unit leaders’ cognitive readiness and their ability to foster such competencies in their subordinates. However, developing cognitive readiness is generally time-consuming, labor intensive, and expensive—requiring dedicated mentorship, years of study, and exposure to diverse experiences. Thus, SUDM organizers recognize that they must help personnel *accelerate* the acquisition of expertise. To achieve this, the initiative has embraced three overarching principles, described below.

1. Enhance cognitive readiness

In order for Marines to employ intuitive decision-making and complex problem-solving skills, they must possess a range of sophisticated competencies. For the sake of scope, the SUDM initiative emphasizes five cognitive competencies, which were identified through

working group meetings with military and civilian subject-matter experts (SUDM, 2011). They are as follows:

- *Adaptability*: Consistent willingness and ability to alter attitudes, thoughts, and behaviors to appropriately respond to actual or anticipated change in the environment.
- *Attentional Control*: Ability to direct and sustain attention on a deliberately chosen target, tolerate sustained attention even when unpleasant, and maintain awareness of own attention.
- *Metacognition*: Thinking about your own thinking; using cognitive strategies to monitor/self-regulate learning and other mental process.
- *Problem Solving*: Understanding the problem space, generating possible solutions, and applying complex strategies to achieve (or move toward achieving) a specific goal.
- *Sensemaking*: Understanding connections (e.g., among people, places, and events) in order to anticipate their trajectories, estimate the overall situation, and act effectively.

Certainly other mental, emotional, and social skills support effective decision-making; however, the initiative emphasizes these five factors because they substantially contribute to applied decision-making effectiveness. (For more details on these skills, as well as the process used to identify them, see the *SUDM January 2011 Workshop* report in the citations list.)

2. Increase meaningful experiences

Experts have many experiences, and they draw upon these memories when faced with cognitive challenges. In other words, effective decision-making is typically demonstrated by individuals who, over the course of a long career, have built robust mental libraries of diverse experiences. Researchers believe that individuals who make effective decisions under ambiguity, stress, and time constraints (i.e., “expert decision-makers”) do so by comparing their current circumstances to a variety of past situations and then selecting a course of action based upon previously observed courses and outcomes (Kahneman & Klein, 2006). Empirical findings indicate that nearly 90% of all effective decisions that involve complex conditions are made in this way, rather than via more formal, analytic approaches (Klein, 1999).

To build upon this research, the SUDM initiative recommends incorporating live and virtual scenario-based learning into Marine Corps’ programs of instruction. Scenario-based learning is a systematic process for guiding students through synthetic experiences that are tailored to learning objectives, students’ prior knowledge, and their unique instructional needs. Rele-

vant scenario-based learning methods are described in more detail later in this paper.

3. Enhance coaching and mentoring skills

In order to foster students' cognitive readiness, devise and deliver effective scenarios, and effectively assess students' progress, instructors must possess high levels of technical skill. In other words, typical military teachers must enhance their skills and instructional mastery in order to meet the SUDM initiative's intent.

Basic instructor courses provide a wide array of suggestions for *good* instruction: e.g., clearly link discrete instructional activities with specific course goals, select relevant assessments, use good planning verbs, and address different levels of knowledge and skill with the instruction. These types of edicts, however, do not reflect the inspiring personal qualities, the motivational planning and delivery, or the innovative assessment and feedback techniques of *great* instructors. While a good instructor can provide Marines with somewhat useful and sometimes interesting instruction, a great instructor is required to help enlisted personnel rapidly develop the cognitive readiness. This last point dovetails with the USMC's Instructor Professionalization initiative, outlined in the next section.

INSTRUCTOR PROFESSIONALIZATION

In order to effectively mentor Marines and help them develop the sophisticated SUDM competencies, instructors must become master facilitators, coaches, and mentors. In other words, instructors cannot merely possess *good* skills—they must be *great*. To help Marine Corps instructors achieve this, TECOM personnel established the Instructor Professionalization initiative. Through it, TECOM personnel, schoolhouse managers, and subject-matter experts are revising the instructor development model, from the training they receive to the types of instructor billets. Below, we describe components of the Instructor Professionalization initiative that have the most applicability for the current discussion.

1. Establish the Instructor Competency Model

Currently, the Marine Corps has no official definition of what constitutes a basic, senior, or master-level instructor, and consequently, across the USMC's 92 training sites, the quality of instructors varies significantly. At good schoolhouses, the course chiefs actively recruit the all-stars from their field to become teachers. However, in other communities, instructors may be assigned based on scheduling convenience or to give personnel a break from repeated deployments. Lacking the motivation, skills, and energy to provide engaging instruction,

these Marines are often less successful, and as a result student and schoolhouse performance suffers and the reputation of instructors, overall, is disparaged. This, in turn, fosters a culture of mediocrity and demotivates students as well as other instructors. Brigadier General Nelson, Commanding General of Training Command, has said explicitly that the Marine Corps cannot continue this model. Platform instructors are among the first examples of a Marine that a young recruit sees, and those instructors must model the total Marine concept.

To help address this, the Instructor Professionalization initiative is defining clearer and more demanding performance criteria for Marine Corps instructors at different levels of professional expertise. Naturally, all instructors continue to have basic administrative and logistical standards they must meet, such as being tactically knowledgeable or understanding administrative procedures. However, in addition to these *good* instructional practices (defined in Order 1553.2B, *Management of Marine Corps Formal Schools*, which is being rewritten to incorporate the new instructor competency model), the SUDM initiative and Instructor Professionalization plan outline four additional attributes that *great* military instructors must actively integrate into all aspects of their duties. These are described below.

Leadership: Great instructors are great leaders. They set big goals for their students and develop these goals with their learners in mind. Great instructors teach at the frontier of student ability and help students to visualize success on a grand, but achievable, scale. They acknowledge obstacles to success, demonstrate determined resolve, and communicate a clear plan to overcome any challenges (e.g., Teach for America, 2009; Bennis, 1989; Kopp, 2011; North Carolina State Department of Public Instruction, 2000; Farr, 2010).

Communication: Great instructors communicate clearly, with an intentional purpose in mind; they tailor their communication style to the needs of their audience and the nature of the message. They ask frequent, challenging questions; monitor students' thinking by carrying on a dialog; and deliver timely, effective feedback (e.g., Teach for America, 2009; Popp, Grant, & Stronge, 2011; Darling-Hammond, 2000).

Expert Technique: The best instructors have a "bag of tricks" that contains a wide array of fresh instructional methods, communication approaches, and assessment techniques. If one strategy fails to achieve desired outcomes, great teachers are prepared to employ alternative approaches, constantly adapting to reach each student (e.g., Grant, Hindman, & Stronge, 2010; Marzano, 1993, 2007; Mayer, 2008; Stronge, 2007).

Table 1. “Great” instructor performance categories**Leadership**

- Sets big goals with measurable standards
- Uses mastery learning—Ensures all achieve mastery
- Encourages students to “own” their learning
- Values and connects with each student
- Motivates Marines via determination and enthusiasm

Communication

- Presents content in clear, compelling ways
- Actively engages students in a dialog
- Asks a variety of direct, thought-provoking questions
- Fluidly adapts communication styles in different settings
- Uses dynamic, emotional language to engage students

Expert Technique

- Plans exhaustively, working backwards from the goal
- Has a large “bag of (instructional) tricks”
- Fluidly adapts instruction for maximum effect
- Maintains engagement with instructional tactics
- Maintains brisk, fluid momentum
- Establishes effective and efficient routines
- Constantly monitors students and the learning context
- Employs frequent, appropriate assessments
- Gives specific, timely, actionable, reflective feedback

Character

- Possesses grit—Works relentlessly, refusing to surrender
- Manages one’s own wellbeing
- Knows oneself, seeks self-improvement
- Acts as a role-model for students

Character: Great instructors work tirelessly, against all odds, refusing to surrender, even if the challenges are substantial. By modeling their willingness to fully commit their time, comfort, and energy to achieve all established learning goals, instructors convey a mindset of relentless determination that Marines are inspired to emulate (e.g., Dunbar, 2004; Stanford, 2001; Farr, 2010; Duckworth et al., 2007, 2009).

In support of this effort, a competency model and a performance rubric were developed. Table 1 lists the categorical anchors from the performance rubric, which cannot be included due to space limitations, but is available in the *SUDM Instructional Handbook* (see Schatz et al., 2012 in the citation list).

2. Develop Tools to Help Instructors Become Great

Next, in order to help instructors meet the expanded performance goals, the team developed a research-based set of support materials, including an instructor handbook, pocket guide, and resource DVD. These materials outline the competencies of expert teachers, in

detail, indicating their scientific foundations as well as practical implementation strategies. They also describe an expert “bag of tricks” that instructors can employ, including specific scenario-based learning methods, instructional tactics, and assessment techniques. The included methods were selected because of their capacity to support higher-level learning as well as their applicability to a military audience. We compiled these various methods from literature review, working group meetings (SUDM, 2011), classroom experience, and stakeholder interviews. The following subsections offer brief descriptions of the various methods, which, we believe, educators and trainers throughout the community may find useful.

Scenario-Based Learning Methods: As mentioned above, SUDM emphasizes the use of scenario-based learning. We identified seven variants of scenario-learning methods that military instructors can use to enhance their classes; these approaches are recommended in addition to (not in lieu of) other well-known military scenario-based training methods, such as live field evolutions.

- *Sand Table Exercises:* A sand table exercise is a decision-forcing exercise in which significant aspects of the problem are depicted on a three-dimensional terrain model.
- *Tactical Decision Games:* In tactical decision games, students have a limited duration in which to solve a tactical challenge. Solutions to the problem are usually expressed as orders, and maps with tactical diagrams are also employed.
- *Decision-Forcing Cases:* Decision-forcing cases are time-constrained activities that require students to devise and discuss practical solutions to a real problem faced by an actual person at some point in the past.
- *Ethical Decision Games:* In ethical decision games, students have a limited duration in which to discuss an ethical challenge and ways to approach the situation.
- *Role-play:* In role-play, students take on the roles of real or imagined people, in order to act out their perspectives and learn about their motivations.
- *Tactical Walks:* Tactical walks, also known as tactical exercises without troops, take place over real terrain. Students visit an actual site and solve scenario-based challenges involving that terrain.

Instructional Tactics: Next, we identified a range of teaching tactics that can enhance military instruction. Instructional *tactics* are the specific activities an instructor performs in order to achieve his/her instructional *strategy*. That is, “instructional strategies involve

meta-level planning prior to instruction, whereas tactics refer to the individual learning activities that take place during the instructional process” (Jonassen et al., 1990, p. 32). Instructional tactics generally fall into five large categories (although some theorists define additional or fewer classes), and the SUDM/Instructor Professionalization materials describe several tactics from each of the categories. These are briefly summarized below, and Table 2 lists their typical usage.

First, *direct instruction* involves explicit teacher-centric instruction, such as lectures. These tactics are best used at the beginning of a new unit of study, to introduce new concepts, or to provide guidance to more novice students. Some direct tactics include the following:

- *Compare and Contrast*: Compare and contrast involves breaking a concept into similar and dissimilar characteristics, which helps students to understand (and often solve) complex problems by analyzing them in a simple way.
- *Drill and Practice*: Drill and practice uses repetition to hone memory and recall. In each iteration, students are given similar questions to answer or activities to perform, with a certain percentage of correct responses or actions allowing them to move to the next level of difficulty. Two examples of drill and practice are using flash cards to memorize human anatomy or repeatedly assembling and disassembling a rifle until it becomes automatic.
- *Demonstration*: Demonstration allows students to view a real or lifelike example of a skill or procedure. In a demonstration, the instructor performs a task, step-by-step, and then guides the students in their own trials, providing feedback both during and after their attempts.
- *Modeling Thinking*: Modeling thinking is different than simply explaining or demonstrating a procedure. When modeling thinking, the instructor performs an activity and talks out loud through his/her thinking processes; anticipating questions, problems, and solutions that students might encounter; and talking through his/her mental strategies.

Next, *indirect instruction* involves teacher-managed student-centric learning, such as guided discussions. Indirect instruction can be used in the middle portion of a block of instruction, to support formative assessments of students, to gauge their reactions to the instruction, or to reinforce and extend their understanding. Some indirect tactics include the following:

- *Visualization*: Visualization is the process of guiding students through a mental simulation of a task, which increases their decision-making skills and general task performance.
- *Concept Maps*: Concept maps are graphical diagrams that show the relationships among concepts. Because concept maps link a visual image with an abstract concept, they improve students’ understanding of complex ideas, help them organize their knowledge, and enhance their critical thinking skills.
- *Case Studies*: Case studies include an in-depth analysis of one or more actual events, including the people involved, their decisions and actions, contextual variables, relevant policies, and the short- and long-term outcomes of the situation. Since case studies are based upon real events, students often become highly engaged and feel a sense of urgency.
- *Metacognitive Prompts*: Metacognitive prompts involve questions and reminders that encourage metacognitive thinking, such as planning, monitoring, and evaluating one’s thinking processes. Metacognitive prompts help students develop metacognitive skills, which substantially enhance future learning outcomes and performance on other cognitive tasks.
- *Mindfulness Exercises*: Mindfulness is the process of paying attention in a particular way, on purpose, in the present moment. In other words, mindfulness is “paying attention to paying attention.” Mindfulness exercises involve brief, guided experiences that help students consciously notice when they become distracted and actively refocus their attention when that happens.

Third, *interactive learning* involves student-centric activities and peer-learning. These methods can be used in the middle of a lesson arc to reinforce and extend students’ understanding, or in situations where some students “get it” and others do not. Interactive learning also works well in conjunction with indirect methods. Some interactive tactics include the following:

- *Premortem*: Premortem exercises encourage personnel to envision a future where a mission has failed and to formulate a list of potential causes, which are then addressed preemptively. This preventative activity builds students’ intuition and sensitivity to potential problems or risks, and it enhances their mission planning skills.

Table 2. Instructional tactics, and their usage recommendations, from the SUDM/Instructor Professionalization materials. The columns on the left indicate general recommendations for which students (by experience level) are most appropriate for each tactic and general guidance on how much time each tactic requires for execution.

		Direct				Indirect				Interactive					Independent				Exp.			
		Compare/Contrast	Drill and Practice	Demonstration	Modeling Thinking	Visualization	Concept Maps	Case Studies	Metacognitive Prompts	Mindfulness Exercises	Premortem Exercises	Crystal Ball	Jigsaw	Cooperative Learning	Fishbowl	Socratic Seminar	Journal Writing	Learning Logs	Field Research	Assigned Questions	Experiments	Model Building
Student Levels	Novice	✓	✓	✓	✓	✓			✓	✓			✓	✓			✓	✓		✓		
	Adv. Beginner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	Competent					✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Proficient					✓				✓	✓				✓	✓	✓	✓	✓	✓	✓	✓
Time Req'd	Limited	✓				✓				✓	✓						✓	✓				
	Moderate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
	Extensive		✓	✓	✓		✓	✓	✓				✓	✓	✓	✓			✓	✓	✓	✓

- *Crystal Ball*: Similar to premortem exercises, the Crystal Ball technique is a “devil’s advocate” method of uncovering assumptions in a given scenario, generating a variety of interpretations of the evidence, and providing alternative solutions for action. Students listen to a brief scenario and offer a short course of action, and then the instructor “gazes into the crystal ball” and tells the Marines that they are wrong. The intent is to force learners to think differently by increasing the number of factors they consider when making a decision and to encourage them to think of alternatives.
- *Jigsaw*: Jigsaw is a cooperative learning technique where students work together to delve deeply into a topic or to complete a complex assignment. In jigsaw, students are grouped into teams, and the instructor designates each team member as an “expert” on one element of the task. Each “expert” completes his/her portion of the task and learns as much as possible about it. Then “experts” brief their fellow team members on their areas of expertise. In the end, all members of the team learn about all aspects of the task, and they retain the information better after this team-teaching activity.
- *Cooperative Learning Groups*: In cooperative learning, students in groups of three or four are assigned “roles” that come with a certain set of responsibilities. Then students work together to complete a task or learning activity while maintaining their roles. This technique helps students see the value of different roles and positions (i.e., team-

building), and they learn how each role helps contribute toward a common goal.

- *Fishbowl*: In a fishbowl discussion, some students are placed within the “fishbowl,” and these students ask questions, gather information, and express their ideas. Students outside of the designated fishbowl listen to the discussion and focus their attention by making notes. Then the roles reverse. This strategy forces students to focus on and think about someone else’s ideas before forming a response, which trains students to respond with logic instead of with emotions and helps them practice active listening.
- *Socratic Seminar*: In a Socratic Seminar, students take turns asking open-ended questions, responding to their peers’ questions, and paraphrasing each other’s responses. Socratic seminars allow students to think critically, analyze their own knowledge, and collectively expose gaps and misconceptions in their mental models.

Fourth, *independent study* involves individual, self-led learning, such as completing homework. Independent study can be assigned at the end of a lesson as a formative assessment or as a way to determine whether each individual student can “tie it all together.” Some independent study tactics include the following:

- *Journal Writing*: Journaling helps students expand and reflect on their understanding of a lesson through writing. While writing a journal entry, students become actively engaged in their own learn-

ing, which gives them an opportunity to clarify and analyze their thinking.

- **Learning Logs:** Learning logs capture students' reflections about their learning. The entries are short, frequent, and factual. In contrast to traditional journals (which tend to be free-flowing, subjective, and full of personal options), learning logs are generally concise and more objective.
- **Field Research:** Field research takes students outside the classroom, library, or computer lab and forces them to directly observe and record their research firsthand. Field research makes students active information seekers.
- **Assigned Questions:** If students do not have enough time to complete a field research project, instructors can use assigned questions. Individuals or small groups of students answer the questions by seeking evidence in books, articles, observations, or through interviews. Students discuss their responses, too, in order to reinforce learning.

Finally, *experiential learning* involves hands-on activities. Experiential methods are often used after students

have mastered basic concepts; for more advanced students; to help students integrate concepts; or to help students learn to apply, think, and innovate in novel situations. Experiential tactics include the following:

- **Experiments:** With experiments, instead of simply being informed about a topic by the instructor, students learn to make predictions, then conduct an experiment to prove or refute their hypotheses. Students "experience" the learning, which helps them retain and apply the acquired knowledge.
- **Model Building:** A model can be a device, equation, picture, or replica. The model performs or predicts how its analogue (i.e., the actual thing) behaves. Scientists, engineers, and students use models to think about, predict, design, and understand how real things work or normally behave.

Assessment Techniques: The SUDM and Instructor Professionalization materials also describe a variety of assessment approaches, observation protocols, behavioral indicators, and scenario-based evaluations. These assessment techniques are described briefly below, and Table 3 summarizes their typical usage.

Table 3. Assessments, and their usage recommendations, from the SUDM/Instructor Professionalization materials. The columns on the left indicate general recommendations for the use of various assessments and indicate whether the different types of measures can support summative (i.e., final, grade-giving) or formative (i.e., intermediate, competency-building) assessment.

		Checklist	BARS	Rubric	Card Sorting	Concept Maps	Metacognitive Prompts	Situational Judgment Test	Traditional Test	Attitude Questionnaire	Reactions Survey
Purpose of Assessment	Set a Baseline (Pretest)	✓	✓					✓	✓	✓	
	Check Compliance							✓	✓		
	Assign a Grade	✓	✓	✓				✓	✓		
	Make a Decision	✓	✓	✓				✓	✓	✓	
	Establish Context (Pretest)		✓		✓	✓		✓		✓	✓
	Check General Outlook			✓	✓	✓	✓			✓	✓
	Check Learning Progress	✓	✓	✓	✓	✓	✓	✓	✓		
	Enhance Learning		✓	✓	✓	✓	✓	✓		✓	
Type	Formative Assessment	✓	✓	✓	✓	✓	✓	✓			
	Summative Assessment	✓	✓	✓				✓	✓		

- **Checklists:** Most often, military instructors use checklists to measure completion, memorization, and/or identification—all of which are lower-order thinking skills. However, checklists can partially gauge higher-level KSAs, as well. The effectiveness of a higher-level checklist is contingent upon its line items; in other words, when creating a higher-level checklist, instructors must ensure the descriptors gauge whether personnel prove, analyze, connect, and/or synthesize. Higher-level checklists should also consider *processes* (i.e., measures of performance) as well as *outcomes* (i.e., measures of effectiveness).
- **Behavioral Anchored Rating Scales:** A Behaviorally Anchored Rating Scale (BARS) is a checklist-style rating system that instructors can use to assess performance goals based upon students' observable actions. A BARS lists different levels of competency on a variety of performance items and then briefly describes behaviors that distinguish among the levels. As with a standard checklist, instructors can use a BARS to rate students' execution of some task, but BARSs are superior to checklists because they include clearer, observation-based indicators of performance and learners can see where they rate on a spectrum of performance.
- **Rubrics:** A rubric lists a set of criteria and their associated standards. Rubrics are typically designed in a grid format, with a fixed rating scale (e.g., 1–5 or Novice–Expert) on one axis and a set of key performance goals across the other. Similar to a BARS, each cell of a rubric includes a definition or example of the performance characteristics at that level. Unlike a BARS, however, rubrics may include more lengthy, non-behavioral factors (e.g., writing quality), and evaluators frequently use rubrics after the fact, to assess the outcomes of students' endeavors or the products of their efforts.
- **Card Sorting:** Card sorting assesses how students mentally structure concepts. As the name implies, with this technique, learners sort a list of specific concepts or vocabulary terms (often provided on note cards) into 4–6 specific categories. Learners may define their own categories (open sort) or instructors may predefine categories (closed sort). Either way, card sorting can reveal unique information about students' conceptualization of a topic.
- **Concept Maps:** When used for assessment, concept maps reveal students' mental model of a topic, including their knowledge gaps and misconceptions. As an assessment, concept maps are best used to gauge whether learners have completely understood a concept and are most effectively used at the end of a classroom-based lesson.
- **Metacognitive Prompts:** Metacognitive prompts are questions that require students to reflect on their knowledge and demonstrate their conceptual understanding of a topic. For assessments, prompts can be made of relevant keywords or phrases that students combine into an accurate, meaningful, and coherent sentence. This process facilitates learning and allows instructors to quickly examine students' comprehension of terms and conceptual understanding of the problem space.
- **Situational Judgment Tests:** Situational Judgment Tests (SJTs) include a realistic scenario followed by potential courses of action, which the students rank order, rate on a Likert-style scale, or simply select the best option from a list. SJTs effectively assess learners' complex problem-solving skills, and they provide evidence about students' mental flexibility.
- **Traditional Tests:** Traditional tests include common paper-based exams, such as multiple-choice tests, true/false, matching, fill-in-the-black, short answer, and long answer. Although these tests tend to target lower-level knowledge, they can more effectively stimulate thinking and better assess students' conceptual understanding if the test items are carefully designed to comprehensively address the learning objectives, include known misconceptions as distractor items, and require students to do more than simply recognize and recall answers.
- **Attitude Questionnaires:** Attitudinal assessments address students' perceptions and attitudes. They can give instructors insights into students' feelings, motivations, and affective reactions to the learning, and they can also serve as self-assessment tools to help students become more metacognitive of their own beliefs and emotions.
- **Reactions Surveys:** If properly designed and employed in a safe environment, reactions surveys can give instructors feedback about their course, content delivery, and teaching ability.

3. Build a Faculty and Staff Development Plan

Finally, in order to help instructors become master teachers, the SUDM and Instructor Professionalization initiatives have devised a faculty and staff development plan, which begins with an intensive two-week course called *Making Good Instructors Great™*. This course introduces military instructors to the principles of cognitive readiness, helps them hone their skills by emphasizing the four themes of expert instructors (i.e., leadership, communication, expert technique, and character, as described above), and teaches them to use the scenario

io-based learning methods, instructional tactics, and assessment techniques discussed in Section 2.

The overall faculty development plan is intended to guide instructors from novice to mastery, through their full career progression. It includes the formal course component, to be offered at a schoolhouse, and it also articulates strategies for integrating learning between schoolhouses, operational units, and self-study, defining a cohesive, lifelong professional development roadmap.

CURRICULUM BETA TEST

A beta test of the *Making Good Instructors Great*TM course was held at the Quantico Marine Corps Base, 11–21 June 2012. Fifty-six Marine Reservists participated as students in support of their predeployment training work-up (see Figure 2). The students came from a variety of occupational specialties, including infantry, communications, and logistics fields, but none had previously served as instructors.



Figure 2. Students in the *Making Good Instructors Great*TM course learn best practices for executing a Sand Table exercise

These Marines are currently mobilizing as the Georgia Deployment Program (GDP) International Security Assistance Forces (ISAF), rotations 8 and 9 (ROTO 8/9) Mobile Training Team (MTT). Over the next year, they will train two Georgian infantry battalions in order to prepare them for combat operations in Afghanistan. The 11-day beta course, therefore, directly supported their mission preparation.

The beta course was designed to incorporate the best practices of great instructors, including variety, ambitious (but achievable) goals, an energetic pace, high degrees of interactivity, mastery learning, interactive discussion, experiential learning, and independent study (just to name a few!). The instructors strove not only to describe instructional excellence, but to also model

expert coaching and mentoring, outstanding communication and feedback technique, and other leadership and character traits that are applicable to all facets of a Marine's life. Overall, the course content and delivery approach substantially impacted the Marines' unit cohesion, cognitive skills, communication abilities, and instructional techniques.

Within a year, formal training effectiveness evaluation data—from this beta course and from longitudinal analysis of these students—will become available. Initial reviews, though, have been overwhelmingly positive. “This is not only going to help us from an immediate mission in Georgia, but this is going to help us from a Marine Corps Reserve perspective,” said LtCol Mark Lamelza, the MTT Officer In Charge (OIC). He went on to explain, “This is important, building instructors, because we [as Reservists] only have 38 days a year to develop Marines. So, you have to have great instructors who can maximize that time and build the proficiency level.”

CONCLUSION

Marine Corps decision makers are currently reviewing the course, handbook, and competency model to determine a formal implementation approach. Also, the complete research report, including longitudinal data describing the students' performance on-the-job in Georgia, is forthcoming. Finally, the *Making Good Instructors Great*TM instructor support materials and curriculum are government-owned, and as such, are freely available (via USMC TECOM) for all US military services and government agencies.

ACKNOWLEDGEMENTS

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressed or implied, of the Department of Defense or the US Marine Corps. The US Government is authorized to reproduce and distribute reprints for Government purposes notwithstanding any copyright notation hereon. This work was supported by contract W15P7T-06-D-E407 sponsored by MAGTF Training and Education Standards Division, TECOM.

REFERENCES

- Becker, W. & Schatz, S. (2010). Higher order cognitive skills training in support of contemporary military operations. In *proceedings of the human factors and ergonomics society annual meeting* (2228-2232). San Francisco, CA. 10.1518/107118110794001090.
- Bennis, W. (1989). *On becoming a leader*. Reading,

- Massachusetts: Perseus Books.
- Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence (Document R-99-1). University of Washington: Center for the Study of Teaching and Policy.
- Dempsey, M. E. (2010). A campaign of learning to achieve institutional adaptation. *Army Magazine*, Nov 2010, 34–35.
- Dempsey, M. E. (2011). The *U.S. Army Learning Concept for 2015* (TRADOC Pam 525-8-2), Department of the Army HQ: U.S. TRADOC.
- Dempsey, M.E. (January 2011), "Mission Command," *Army Magazine*, 43-44.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087–1101. doi: 10.1037/0022-3514.92.6.1087
- Duckworth, A. L., Quinn, P. D. & Seligman, M. E. P. (2009). Positive predictors of teacher effectiveness. *The Journal of Positive Psychology*, 4(6), 540–547.
- Dunbar, C. (2004). Best practices in classroom management. East Lansing, Michigan: College of Education, Michigan State University. Retrieved: <https://www.msu.edu/~dunbarc/dunbar3.pdf>.
- Etter, D. M. (2002). Cognitive readiness: an important research focus for national security. In M. C. Roco & W. S. Bainbridge (Eds.), *Converging technologies for improving human performance: Nanotechnology, biotechnology, information technology and cognitive science*. Arlington, VA: NSF.
- Farr, S. (2010) Teaching as leadership: The Highly effective teacher's guide to closing the achievement gap. San Francisco, CA: Teach For America.
- Fautua, D. & Schatz, S. (2012). Cognitive Readiness and the challenge of institutionalizing the "new" vs. "news." *Journal of Cognitive Engineering and Decision Making*, 6(3). doi: 10.1177/1555343412444366
- Fautua, D., Schatz, S., & Vierling, K. (2011). The Cognitive Skill-Stance Hierarchy: A "new" training framework. *Proceedings of IITSEC*, Orlando, FL.
- Grant, L. W., Hindman, J. L., & Stronge, J. H. (2010). *Planning, instruction, and assessment: Effective teaching practices*. Larchmont: Eye on Education.
- Jonassen, D. H., Grabinger, R. S., & Harris, N. D. C. (1990). Analyzing and selecting instructional strategies and tactics. *Performance improvement quarterly*, 3(2), 29-47.
- Kahneman, D. & Klein, G. (2009). Conditions for intuitive Expertise A failure to disagree. *American Psychologist*, 64(6), 515–526.
- Klein, G. (1999). Applied decision making. In P. A. Hancock (Ed.), *Human performance and ergonomics* (pp. 87–107). San Diego: Academic Press, Inc.
- Kopp, W. (2011). *A chance to make history: What works and what doesn't in providing an excellent education for all*. Philadelphia, PA: US by PublicAffairs.
- Lynn, W. J. (2010). Strategy for the next generation of training for the Department of Defense. Washington, D.C.: Office of the Secretary of Defense.
- Marine Corps Publication. (2008). *Management of Marine Corps Formal Schools, Professional Military Education (PME) Schools and Training Detachments* (Marine Corps Order 1553.2B). Washington, DC: Department of the Navy.
- Marine Corps Publication. (2010). *35th Commandant of the Marine Corps Commandant's Implementation Planning Guidance* (PCN 50100700000). Washington, DC: US Marine Corps.
- Marine Corps Publication. *Marine Corps Vision & Strategy 2025* (PCN 50100654800). Washington, DC: US Marine Corps.
- Marzano, R. (1993). How classroom teachers approach the teaching of thinking. *Theory into Practice*, 32(3), 154–60.
- Marzano, R. (2007). *The art and science of teaching: A comprehensive framework for effective instruction*. ASCD: Alexandria, VA.
- Mayer, R. E. (2008). Learning and instruction. Upper Saddle River, New Jersey: Pearson Education, Inc.
- Morrison, J. E. & Fletcher, J. D. (2002). *Cognitive Readiness* (IDA Paper P-3735). Alexandria, VA: Institute for Defense Analysis.
- North Carolina State Department of Public Instruction (2000). Closing the Achievement Gap: Views from Nine Schools. Raleigh, NC: North Carolina State Dept. of Public Instruction.
- Popp, P. A., Grant, L. W., & Stronge, J. H. (2011). Effective teachers for at-risk or highly mobile students: What are the dispositions and behaviors of award-winning teachers? *Journal of Education for Students Placed at Risk*, 16(4), 275–291.
- Schatz, S., Bartlett, K., Burley, N. Nicholson, D., & Taylor, A. (2012). *Making Good Instructors Great: US Marine Corps Small Unit Decision Making Instructional and Assessment Techniques Handbook*. Orlando, FL: MESH Solutions, LLC.
- Stanford, B.H. (2001). Reflections of resilient, persevering urban teachers. *Teacher Education Quarterly*, 28, 75–87.
- Stronge, J. H. (2007). Qualities of effective teachers, 2nd edition. Alexandria, VA: ASCD.
- SUDM [Small Unit Decision Making] (2011). *US Marine Corps Small Unit Decision Making January 2011 Workshop Report*. Quantico, VA: USMC Training and Education Command.
- Teach For America. (2009). *Teaching as Leadership*. Retrieved www.teachingasleadership.org.
- Vane, M. & Toguchi, R. (2010, May-Jun). Achieving excellence in small unit performance. *Military Review*, pp. 73–81.